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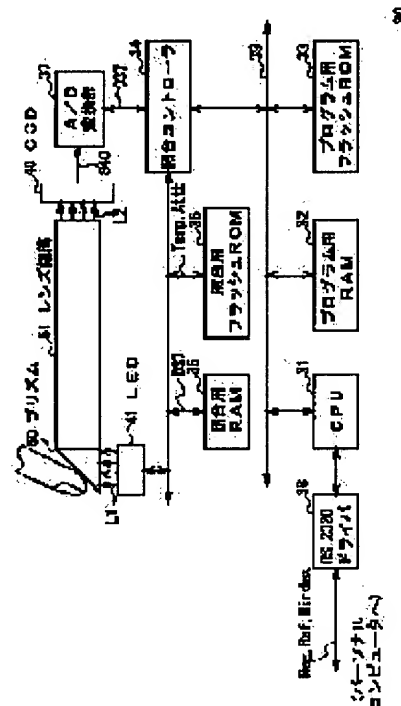
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(54) DEVICE AND METHOD FOR COLLATING FINGERPRINT

(57)Abstract:

PROBLEM TO BE SOLVED: To prevent an illegal use of illegally inputting read fingerprint information from the outside by storing read history information, with which the read fingerprint information is generated, in a read history storage means and performing personal verification by collating the read fingerprint information with registered fingerprint information when the read history information is stored in the read history storage means.

SOLUTION: A collation controller 34 irradiates the lower surface of a prism 50 with illumination light L1 by turning on an LED 41 and the prism 50 generates an image signal S40 by reflecting the illumination light L1 and emitted it to a CCD 40 as reflected light L2 showing a fingerprint image. The image signal S40 is subjected to digital conversion and binarized later by an analog/digital converting part 37. In this case, when fingerprint image data D37 can be normally generated, the collation controller 34 sets a fingerprint fetch flag to a RAM 32 for program. Only when the fingerprint fetch flag is set to the RAM 32 for program, the collation controller 34 executes the collation of a fingerprint template and the fingerprint image data D37.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention is applied to the fingerprint collation device which performs individual authentication using a fingerprint, concerning a fingerprint collation device and the fingerprint collating method, and is suitable.

[0002]

[Description of the Prior Art] Conventionally, there is a fingerprint collating machine which performs individual authentication using a fingerprint. This fingerprint collating machine photos a user's fingerprint using an image pick-up element etc., and generates a fingerprint picture. And a fingerprint collating machine performs individual authentication by collating the photoed fingerprint picture concerned and the fingerprint picture for [which is registered beforehand] collating. a fingerprint -- the whole life -- since it differs for every individual while it is eternal, individual authentication can be ensured

[0003]

[Problem(s) to be Solved by the Invention] However, when the 3rd person extracts others' fingerprint from a cop etc., forges a fingerprint picture, inputs the forged fingerprint picture concerned into a fingerprint collating machine and performs fingerprint collating, the unauthorized use which becomes others, finishes and performs individual authentication can be considered.

[0004] this invention was made in consideration of the above point, and tends to propose the fingerprint collation device which can prevent an unauthorized use, and the fingerprint collating method.

[0005]

[Means for Solving the Problem] In order to solve this technical problem, it sets to this invention. While reading a user's fingerprint and generating reading fingerprint information in the fingerprint collation device which compares a user's fingerprint with the registration fingerprint information registered beforehand, and performs individual authentication A fingerprint reading means to generate the reading history information which shows having generated the reading fingerprint information concerned, A reading history storage means to memorize reading history information, and a collating means to have collated reading fingerprint information and registration fingerprint information, to have performed individual authentication, and to output an authentication result when reading history information is memorized by the reading history storage means were established.

[0006] Since individual authentication is not performed even if it inputs reading fingerprint information into injustice from the exterior by collating reading fingerprint information and registration fingerprint information, and having been made to perform individual authentication, when the reading history information which shows having generated reading fingerprint information is memorized for a reading history storage means and reading history information is memorized by the reading history storage means concerned, an unauthorized use prevents.

[0007]

[Embodiments of the Invention] About a drawing, the gestalt of 1 operation of this invention is explained in full detail below.

[0008] (1) In the whole fingerprint collating system block diagram 1, 1 shows the fingerprint collating system by this invention as a whole, and has the composition in which the card reader 20 which write data to the IC (Integrated Circuit) card 21, and the fingerprint collating machine 30 as a fingerprint collation device were connected to the personal computer 10. It connects by the serial interface of RS232C specification, respectively between a personal computer 10 and a card reader 20 and between the personal computer 10 and the fingerprint collating machine 30.

[0009] The fingerprint collating machine 30 incorporates a user's fingerprint, performs fingerprint collating using either of the fingerprint templates registered into the fingerprint template (an authentication candidate's reference fingerprint data) or IC card 21 registered into the fingerprint collating machine 30 concerned, and outputs the result of the fingerprint collating concerned to a personal computer 10.

[0010] Two or more fingerprint templates are registered into the fingerprint collating machine 30, and each fingerprint template is the index number Nindex. It is discriminated. Moreover, the fingerprint template of the owner of IC card 21 concerned is registered into IC card 21.

[0011] (2) Respond to fingerprint-registration operation according [a personal computer 10] to a user when registering an

authentication candidate's fingerprint into the fingerprint registration processing fingerprint collating machine 30, and it is the fingerprint registration instruction Reg to the fingerprint collating machine 30. And index number Nindex specified by the user It transmits.

[0012] Drawing 2 shows the fingerprint collating machine 30 as a whole, and CPU31, RAM32 for a program (Random Access Memory), the flash ROM 33 for a program (Read Only Memory), and the collating controller 34 are connected to the main bus 39. CPU31 reads a control program from the flash ROM 33 for a program, develops and performs it to RAM32 for a program, and controls the fingerprint collating machine 30 whole.

[0013] That is, CPU31 is the fingerprint registration instruction Reg transmitted from the personal computer 10. And index number Nindex It receives through the RS232C driver 38. And CPU31 is the fingerprint registration instruction Reg. It responds, the collating controller 34 is controlled and reading of a fingerprint is started.

[0014] The collating controller 34 turns on Light Emitting Diode41 according to control of CPU31, and irradiates the lighting light L1 on the undersurface of prism 50. At this time, the user does the pressure welding of the fingerprint side of the finger which it is going to register to the slant face of prism 50.

[0015] Prism 50 reflects the lighting light L1 by the inside of the slant face, and it carries out outgoing radiation to CCD (Charge Coupled Device : charge-coupled device)40 through the lens (not shown) prepared in the lens barrel 51 as the reflected light L2. When an air space is in the external surface of a slant face, while prism 50 carries out total reflection of the lighting light L1, when there is no air space in the external surface of a slant face, it diffuses the lighting light L1 here. For this reason, while the lighting light L1 is reflected since the crevice of a fingerprint has an air space when the pressure welding of the fingerprint side of a finger is carried out to the slant face of prism 50, since an air space is lost, the lighting light L1 diffuses the heights of a fingerprint. Thereby, the reflected light L2 serves as a picture bright in the crevice of a fingerprint with the dark heights of a fingerprint. CCD40 picturizes the reflected light L2, generates a picture signal S40, and outputs it to an analog / digital transducer 37. Optical reading of a fingerprint is performed in this way.

[0016] After an analog / digital transducer 37 carries out digital conversion of the picture signal S40, it is made binary, and it is outputted to the collating controller 34 as fingerprint image data D37. At this time, the collating controller 34 displays the fingerprint image data D37 on the monitor 11 of a personal computer 10 (drawing 1) through the RS232C driver 38. Thereby, a user can check his photoed fingerprint and can adjust the arrangement of a finger to prism 50.

[0017] The collating controller 34 extracts the focus (the central point, the branch point, etc. of a pattern of a fingerprint) of a fingerprint from the fingerprint image data D37, and generates the fingerprint template Temp. And the collating controller 34 is the index number Nindex in the flash ROM 35 for collating about the attribute Attb which is the information which accompanies the fingerprint template Temp and the fingerprint template Temp concerned as shown in drawing 3 . It records and registers with the specified index (address), and completion of fingerprint registration is notified to a personal computer 10 (drawing 1).

[0018] (3) When performing fingerprint collating using the fingerprint template Temp registered into the fingerprint collating processing fingerprint collating machine 30 by the fingerprint template in a fingerprint collating processing (3-1) fingerprint collating machine, a user uses a personal computer 10, and they are fingerprint collating start operation and the index number Nindex. It inputs. A personal computer 10 responds to this and is the fingerprint collating instruction Ref to the fingerprint collating machine 30. And index number Nindex specified by the user It transmits.

[0019] It is the fingerprint collating instruction Ref to which CPU31 was transmitted from the personal computer 10 in drawing 2 . And index number Nindex It receives through the RS232C driver 38 and is the fingerprint collating instruction Ref. It responds, the collating controller 34 is controlled and reading of a fingerprint is started.

[0020] According to control of CPU31, the collating controller 34 turns on Light Emitting Diode41 like the time of fingerprint registration, and irradiates the lighting light L1 on the undersurface of prism 50. At this time, the user does the pressure welding of the fingerprint side of a finger to the slant face of prism 50.

[0021] Prism 50 reflects the lighting light L1 by the inside of the slant face, and it carries out outgoing radiation to CCD40 as a fingerprint reading means through the lens (not shown) prepared in the lens barrel 51 as the reflected light L2 which shows a user's fingerprint picture. CCD40 picturizes the reflected light L2, generates a picture signal S40, and outputs it to an analog / digital transducer 37. After an analog / digital transducer 37 carries out digital conversion of the picture signal S40, it is made binary, and it is outputted to the collating controller 34 as fingerprint image data D37.

[0022] When the fingerprint image data D37 is able to generate normally here, the collating controller 34 as a fingerprint reading means sets to RAM32 for a program as a reading history storage means the fingerprint incorporation flag as reading history information which shows that reading of a fingerprint was completed.

[0023] And the collating controller 34 as a collating means is the index number Nindex. The specified fingerprint template Temp is read from the flash ROM 35 for collating, and it collates with the fingerprint image data D37.

[0024] At this time, the collating controller 34 performs collating of the fingerprint template Temp and the fingerprint image data D37, only when the fingerprint incorporation flag is set to RAM32 for a program, and when the fingerprint incorporation flag is not set to RAM32 for a program, it does not perform collating. That is, the fingerprint collating machine 30 performs fingerprint collating only by the fingerprint image data D37 read with the fingerprint collating vessel 30 concerned, and even if it inputs the fingerprint image data D37 from the outside, the fingerprint collating machine 30 does not perform fingerprint collating. Thereby, the unauthorized use using the fingerprint image data forged, for example can be prevented.

[0025] After the collating end of the fingerprint template Temp and the fingerprint image data D37, the collating controller 34

resets the fingerprint incorporation flag of RAM32 for a program, and transmits a collating result for a collating result to a personal computer 10 (drawing 1).

[0026] (3-2) When performing fingerprint collating using the fingerprint template Temp registered into fingerprint collating processing IC card 21 by the fingerprint template in an IC card, a user inputs fingerprint collating start operation using a personal computer 10 while inserting IC card 21 concerned in a card reader 20. A personal computer 10 responds to this and is the fingerprint collating instruction Ref. It transmits to the fingerprint collating machine 30.

[0027] CPU31 (drawing 2) is the fingerprint collating instruction Ref. It responds, the collating controller 34 is controlled and reading of a fingerprint is started. According to control of CPU31, the collating controller 34 reads a user's fingerprint like the time of fingerprint registration, generates the fingerprint image data D37, and memorizes it to RAM36 for collating. Here, when the fingerprint image data D37 is able to generate normally, the collating controller 34 sets to RAM32 for a program the fingerprint incorporation flag which shows that reading of a fingerprint was completed.

[0028] Moreover, the collating controller 34 reads the fingerprint template Temp registered into IC card 21 through a personal computer 10, and stores it in index #0 of the flash ROM 35 for collating. And the collating controller 34 reads the fingerprint template Temp from index #0 of the flash ROM 35 for collating, and collates it with the fingerprint image data D37.

[0029] At this time, the collating controller 34 performs collating of the fingerprint template Temp and the fingerprint image data D37, only when the fingerprint incorporation flag is set to RAM32 for a program, and when the fingerprint incorporation flag is not set to RAM32 for a program, it does not perform collating.

[0030] After the collating end of the fingerprint template Temp and the fingerprint image data D37, the collating controller 34 resets the fingerprint incorporation flag of RAM32 for a program, and transmits a collating result for a collating result to a personal computer 10 (drawing 1).

[0031] (4) In the composition beyond operation and an effect, the fingerprint collating machine 30 incorporates a user's fingerprint, and generates the fingerprint image data D37. At this time, when the fingerprint image data D37 is able to generate normally, the collating controller 34 sets a fingerprint incorporation flag to RAM32 for a program.

[0032] And the collating controller 34 collates the fingerprint template Temp and the fingerprint image data D37 in the fingerprint collating machine 30 or IC card 21, only when the fingerprint incorporation flag is set to RAM32 for a program.

[0033] In case according to the above composition a user's fingerprint is incorporated and the fingerprint image data D37 is generated, only when a fingerprint incorporation flag is set and the fingerprint incorporation flag concerned is set, even if it inputs the fingerprint image data D37 into the fingerprint collating machine 30 from the exterior by performing fingerprint collating, fingerprint collating cannot be performed, but the unauthorized use using the fingerprint image data which this forged can be prevented.

[0034]

[Effect of the Invention] The reading history information which shows having generated reading fingerprint information as mentioned above according to this invention is memorized for a reading history storage means. When reading history information is memorized by the reading history storage means concerned, even if it inputs reading fingerprint information into injustice from the exterior by collating reading fingerprint information and registration fingerprint information, and having been made to perform individual authentication, in order not to perform individual authentication, The fingerprint collation device which can prevent an unauthorized use can be obtained.

[Translation done.]

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CLAIMS

[Claim(s)]

[Claim 1] While reading the above-mentioned fingerprint and generating reading fingerprint information in the fingerprint collation device which compares a user's fingerprint with the registration fingerprint information registered beforehand, and performs individual authentication A fingerprint reading means to generate the reading history information which shows having generated the reading fingerprint information concerned, The fingerprint collation device characterized by having a reading history storage means to memorize the above-mentioned reading history information, and a collating means to collate the above-mentioned reading fingerprint information and the above-mentioned registration fingerprint information, to perform individual authentication, and to output an authentication result when the above-mentioned reading history information is memorized by the above-mentioned reading history storage means.

[Claim 2] The above-mentioned collating means is a fingerprint collation device according to claim 1 characterized by performing the above-mentioned individual authentication using the above-mentioned registration fingerprint information supplied from the outside.

[Claim 3] It is the fingerprint collation device according to claim 1 which is equipped with a registration fingerprint information-storage means to memorize the above-mentioned registration fingerprint information, and is characterized by the above-mentioned collating means performing the above-mentioned individual authentication using the above-mentioned registration fingerprint information memorized by the above-mentioned registration fingerprint information-storage means.

[Claim 4] While reading the above-mentioned fingerprint and generating reading fingerprint information in the fingerprint collating method of comparing a user's fingerprint with the registration fingerprint information registered beforehand, and performing individual authentication Generate the reading history information which shows having generated the reading fingerprint information concerned, and the above-mentioned reading history information is memorized for a reading history storage means. The fingerprint collating method characterized by collating the above-mentioned reading fingerprint information and the above-mentioned registration fingerprint information, performing individual authentication, and outputting an authentication result when the above-mentioned reading history information is memorized by the above-mentioned reading history storage means.

[Translation done.]